

METHOD OF DETERMINING BOUNDARY INTERFACE CHANGES
IN A NATURAL RESOURCE DEPOSIT

ABSTRACT OF THE DISCLOSURE

A method of determining changes in the boundary interface in a sub-surface oil reservoir between the to-be-recovered oil and a driveout fluid, such as steam, uses time-displaced gravity gradient measurements to provide an indication of the changes in the gravity gradient over time. The measured data are subject to simulated annealing optimization to find the global minimum that best represents the observed values within the solution space. The optimization process includes establishing an appropriately constrained model of the oil reservoir and a quantized set of mathematically related parameters that define the model. Successive models are perturbed and evaluated from a figure of merit standpoint until a global minimum that best describes the measured time-lapse data is found.